

## ABSTRACT OF THE DISCLOSURE

Methods and apparatus are provided for performing reversible color conversion on digital image data using integer computer arithmetic. This color conversion provides an approximation of the luminance component to the luminance as perceived by the human visual system with any necessary precision ( $K_d$ ) and without multiplication and division operations other than shifts. The color conversion can be used in conjunction with a lossless or lossy compression/decompression process. Other embodiments, including non-reversible and non-integer color conversion, are also provided.